

Crossing boundaries: the affordances of new technologies in supporting a collaborative learning environment for doctoral students learning transnationally

This paper reports findings of an 18 month research project, funded by the Higher Education Academy in the United Kingdom (UK), to develop understanding of pedagogical differences in employing emerging technologies with transnational doctoral students. The focus of the research is a Professional Doctorate course delivered by a UK based university and taught in Hong Kong (HK) by UK academic staff over 4 weekends each year, with supervisory support throughout the academic year by tutors based in the UK. The research investigated the use of different technologies to enhance the learning experience of the students through **three cycles of action research**. While literature is extensive in using technologies in learning and teaching in the West, and in teaching international students, there appears to be a lack of research focussing on employing emerging technologies with transnational students in Asia. A multi-layered approach to data collection through observation of software analytics, questionnaire and focus groups has resulted in the introduction of new technologies, through which a community of practice, encompassing students in HK and the UK, has emerged. This paper reports a new evidence informed framework which moves current discourse forward.

Keywords: technology; post-graduate; doctoral; transnational; higher education; Asian higher education; collaborative learning; community of practice; **action research**.

Introduction

As the recruitment of transnational students continues to increase, it is important to develop evidence informed practice in using technologies with students who have different cultural identities as part of a programme of learning (Slethaug, 2007; Carroll & Ryan, 2007; Arenas, 2009; Wilkins, Balakrishnan & Huisman, 2012; O'Mahony, 2014). Research into learning experiences of transnational students is limited (Wilkins, Balakrishnan & Huisman, 2011), despite the United Kingdom's (UK) Higher Education Statistics Agency (HESA), reporting that UK universities had 598,925 transnational students (2012/13), increasing to 663,915 in 2014/15. This research makes a contribution to transnational higher education research focussing specifically on the use of technologies with post-graduate students. A literature review indicates this is an under-researched area of Higher Education (McConnell, Banks & Bowskill, 2008; Arenas, 2009; Choudaha & de Wit, 2014). The focus for the research was a part-time Doctorate in Education course delivered in Hong Kong (HK), provided by a host university based in the UK. This paper shares UNESCO and Council of Europe's (2000) definition of transnational higher education as learners based in a country different to the awarding institution.

This paper reports findings from an 18 month research project, part-funded by the UK Higher Education Academy. The research set out to identify whether changes in the use of the host university's Virtual Learning Environment (VLE) and the introduction of new technologies, would improve engagement, engender a deeper level of learning and provide an opportunity for a faster pace of progression for transnational students. As a result of the research an evidence informed framework for using technologies with transnational students is proposed, which responds to Choudaha & de Wit's (2014) research identifying the need for higher education to recognise transnational students' needs and ensure appropriate models of

delivery. Although focused on post-graduate students this research has the potential to inform others facing the challenge of using technologies with transnational students, particularly those in southeast Asia.

Context

UK universities have been developing collaborations with partners in Asia for several decades. HESA (2014/15) reports that Asia accounts for 20% of the UKs transnational students (TNEs). Tutors are often flown from the UK to deliver courses over short periods of time, often with limited understanding of Asian cultures and pedagogies (Adamson, Nixon & Su, 2012; Caruana and Montgomery, 2015) and often lack of prior experience of Asian students in using technologies in learning (Watkins, 2000).

In the UK the course informing the research forms part of a suite of Professional Doctorate courses, equivalent to a Doctor of Philosophy, taught both in the UK and HK. The students in the research were all on the Doctorate in Education, working as a senior professional, undertaking research which would impact significantly on their professional context and contribute new knowledge to their profession. The focus for the research was the students learning in HK. Teaching in HK was provided by the host university flying academic staff to HK for 4 taught workshops each year, with supervisory support throughout the academic year by tutors based in the UK. Students were typically working at senior professional level in educational institutions in Hong Kong. The course comprised five taught and assessed modules. At the start of the research there were three cohorts of students in HK (n=35) with a further cohort starting part-way through the research (n=10).

The use of technologies within the course at the start of the research was limited to a VLE with students sharing the same VLE learning areas as those studying the same course in the UK. The VLE was used as a space for students to access course learning materials. While some university's VLEs are sophisticated in that they provide online spaces for co-

constructing knowledge, such as Pebblepad, this VLE was limited, providing spaces for course learning materials, an ePortfolio, email access, a discussion board and access to an open (rather than private) blog. VLE analytics data identified that the HK students had limited engagement with the VLE compared to those studying the same course in the UK; HK students were making slower progress than students on the course in the UK despite researchers identifying that Chinese students generally out-perform students from the west (Watkins & Biggs, 2001; Adamson, Nixon & Su, 2012).

Literature review

Different cultures, different learners?

Increasing numbers of international and transnational students studying at UK universities has resulted in greater cultural diversity which presents new challenges and complexities for tutors (Ryan & Louie, 2007) in communicating effectively and efficiently across cultures while recognising the legitimacy of cultural practices (Armstrong, Armstrong & Barton, 2000; Caruana & Spurling, 2007). There is much problematizing in higher education when considering approaches to learning, prior pedagogic experience, studying in a second language and adjusting to unfamiliar education contexts, each of which can impede learning and challenge expectations (McLean & Ransom, 2005; Yang 2006; Chen, Bennett & Maton, 2008; Arenas, 2009; Choudaha, Orosz & Chang, 2012; Fiske and Taylor, 2013). While there is value in understanding how different cultures learn (Watkins & Biggs, 2001), there are criticisms that students from the same culture cannot be seen as a homogeneous group (Jones, 2005).

Literature specific to Asian students identifies differences in approach to learning (Chapman & Pyvis, 2007; Smith, 2009; Hoare, 2013; O'Mahoney, 2014), while differences in pedagogic experience are seen as ‘substantial’ (Yang, 2006: 48). Chinese students are

identified as passive learners who do not enjoy class discussions, valuing their tutor's opinion rather than their peers (Roberts & Tuleja, 2008: 476). It could be argued that this may be due to student's prior pedagogic experience; teaching in China often comprises tutor-centred lectures and rote learning, presenting challenges and potential barriers when using technologies requiring autonomous learning and engagement (Watkins & Biggs, 2001; Ishii & Shiobara, 2008; McConnell, Banks & Bowskill, 2008; O'Mahoney, 2014).

Research identifies that Asian culture recognises authority differences between students and their educators: learners view educators as higher level members of society, out of respect they will not question or challenge them, thus becoming passive receivers of established knowledge, seldom challenging the validity of knowledge (Yang, 2006; Rees (2010). It is argued that this cultural perception could hinder interaction between students and educators (Watkins, 2004; Rees, 2010; Waters & Leung, 2013). Research also suggests that Asian students are taught to listen to their authority figures and memorize what they are told as truth, while western learners are encouraged to be independent, developing their individual epistemology and ontology, guided by educators (Boyle, 2000; Chen, Bennett & Maton, 2008). However, Caruana & Spurling (2007) argued that Asian learners value opportunities to learn from diverse others through fostering cross-cultural skills, positive attitudes, patience, knowledge and understanding.

Thus there is recognition in the literature that Asian students may have different approaches to learning, different pedagogic experiences and relationships with tutors developed through different cultural learning experiences. These may impact on their motivations and how they engage with learning technologies.

Motivations to learn

Watkins & Biggs (2001) and Wilkins, Balakrishnan & Huisman (2012) suggested Asian

student's motivations to study for qualifications are different to UK students. There is a general belief in southeast Asian society that academic results are top priority for learners, parents and some teachers (Huang and Waxman, 1995; Sun, 1998; Watkins & Biggs, 2001) with over 70% of parents putting their child's academic performance as their top priority, above their child's health (Liu and Lu, 2011). This is also supported by Wang (2007) who identified that three quarters of southeast Asian students in her research were self-motivated, with 25% of students studying for the pride of their families. More recently, Waters & Leung (2013) claimed that in HK, there was increased social pressure to obtain a degree, therefore students may be studying for social benefits as opposed to personal pride and ownership.

Learning with technologies

Universities are continually developing the use of new and emerging technologies to support student learning, often with limited knowledge of what works (Ross, 2016) and little awareness of different prior experiences of technologies by culturally different learners. There is an increasing expectation that both staff and students have good levels of digital literacy. Indeed, standards for UK lecturers, set out in the Higher Education Academy's Professional Standards Framework, were updated in 2011 to place a greater emphasis on the use of digital technologies in learning and teaching. The increased use of online and blended learning in UK universities is resulting in emerging pedagogic practice (Minocha & Thomas, 2007; Bennett, Bishop, Dalgarno, Waycott & Kennedy, 2012; Boulton & Hramiak 2012; Palmer & Holt, 2012) and increased pressure for tutors to facilitate students' development of digital wisdom.

The literature recognises challenges when using technologies with students working at international branch campuses. For example, Caruana & Spurling (2007: 73) identified technology can contribute to 'marginalising rather than empowering already marginalised

groups', acknowledging that done well 'online collaboration fosters a cross-fertilisation of perspectives and ideas from different cultural, social, political and economic standpoints'. Wang (2007) claimed that cultural differences between Asian countries are vast when using technologies to learn, preferring self-contained and private learning experiences, with low levels of peer interaction as students took ownership of their work alone. Chen, Bennett & Maton (2008) found their international sample cohort displayed less willingness to utilise the internet to search for resources and contributed less intellectual online messages.

Online communication for Hong Kong students in this study depends on written English which can be challenging for Asian students often working in their second language impacting on engagement (Thompson & Ku, 2005; Dillon, Wang & Tearle, 2007). However, Tu (2001) identified the importance of scrutinising all of the variables (interactivity, lack of connection, message length, replies, and absence of non-verbal cues) to support engagement when using technologies with Asian students.

Dillon, Wang & Tearle (2007) identified cultural differences in students using VLEs. VLEs have been used in UK schools, colleges and universities since the 1990s (Gillespie, Boulton, Hramiak & Williamson, 2007), providing a space in which interactions can occur and students become actors in co-constructing the virtual space (Dillenbourg, Schneider & Synteta, 2002). This is a different perspective to that in HK, evidenced by a survey of 118 secondary schools, which identified technology use in learning as relatively low (Centre for Information Technology in Education, 2015).

However, Kersh, Pachler & Daly (2009) identify using new technologies does not inevitably lead to a coherent experience. While longitudinal research by Bennett et al. (2012) and Palmer & Holt (2012) indicated that students need to see a value in accessing technologies in learning. Thus, careful planning to ensure a shared and coherent experience

by students who understand the value of co-constructing knowledge, is needed when introducing new technologies.

The literature therefore identifies cultural differences between western and Asian students in terms of approaches to learning, motivation to study, relationship with tutors, pedagogy and experience of using technologies in learning. Challenges have been identified such as students working in a second language, lack of online engagement and challenges for host universities in ensuring a high quality learning environment and the requirement to have a clear purpose for the use technologies in learning, which is shared with transnational learners. However, it is recognised that transnational students are not a homogenous group.

This research set out to answer the following research questions:

- To what extent can changes to a university's VLE improve engagement for transnational students?
- Can the introduction of new technologies improve engagement, engender a deeper level of learning and faster pace of progression for doctoral transnational students?

Methods and methodology

This 18 month research project was framed by action research (Carr & Kemmis, 1986; Reason & Bradbury, 2006; McNiff & Whitehead, 2009) which provided a framework of planning, making changes, evaluating the impact and reflection on each cycle before starting the next cycle, thus ensuring changes were appropriately evaluated through data collection. This process enabled a transformation of knowledge and practice (McNiff & Whitehead, 2009). This section sets out each cycle, data collected and actions taken.

Participants

All students in HK were invited to participate via email; all 35 students agreed. The age of the HK student respondents was 25 to 59; 17 male and 18 female students. Of these 33 worked full-time while completing the course, mainly in senior professional positions within

a variety of educational institutions. Ethical approval was gained and full written consent given by all participants who understood their right to withdraw from the research.

Data collection

Both qualitative and quantitative data were collected: qualitative data enabled context specific data to be collected and analysed, facilitating and supporting student voice through the research; quantitative baseline data was provided from software analytics.

Cycle one comprised analysis of baseline data from VLE analytics to inform the research. Usage of the VLE by HK students was identified; number of accesses, length of each access, and most accessed areas of the VLE. This was compared with usage by UK students on the same course over the same period. Further baseline data was collected from HK students via a **newly designed** online questionnaire to identify prior experience of using technologies in learning. **This questionnaire, informed by the literature review, was designed to gather qualitative and quantitative data.** The questionnaire comprised four main sections: **Section A focussed on basic information such as age, sex, nationality, occupation and type of occupation, such as full-time and part-time.** Section B requested information relating to prior experience of learning and teaching; this section provided tick boxes, with provision for additional text; the focus was on how students had been taught previously, their preferred style of learning, and resources, including online resources, used in learning. **Section C requested information relating to how often they used the VLE, any problems they encountered and how these were resolved, what they used the VLE for, and previous experience of using a VLE in learning.** Section D related to the aesthetics of the VLE, including font, use of icons and images, and possible ‘add ins’ they might find useful such as a translation button, improved navigation tools, calendar and online forums.

A further questionnaire, completed at the start of the research, informed by baseline data collection and literature review, was intended to identify any cultural differences in the design of the VLE. This focussed on semiotics such as images, symbols, colour and layout, textual cues and other cultural attractors such as visual navigation and colour combination (Chen, et al., 1999; Smith et al., 2004). This second questionnaire was completed by students during a taught workshop in HK; as not all students attended this workshop there was a 70% response rate which was equal across each cohort. The questionnaire was emailed to those students not attending, resulting in an overall response rate of 97%. In addition desk-based research was carried out to further identify similarities and differences in online design with HK university websites; this was carried out by examining the websites of 8 universities in Hong Kong and comparing their design in terms of images, symbols, colour, layout, navigation, and colour combination. The data was analysed, informing developments to the VLE and introduction of a blog.

In cycle two data was collected via two student focus group interviews which were held using Skype, lasting between 30 and 40 minutes; each focus group comprised six students. Semi-structured questions were asked to gather data related to the impact of the developments to the VLE in cycle one and impact of changes in their use of the technologies. Each interview was recorded, transcribed and compared with the recording for accuracy. A thematic analysis was then carried out following the stages described by Braun and Clarke (2006). The findings informed further developments to the VLE, the introduction of a wiki and a complete review of the course induction.

Cycle three provided opportunity to embed a wiki within the pedagogy of taught workshops. At the end of this cycle VLE analytics were analysed and compared to baseline data statistics collected in cycle one. Comparison was carried out between the VLE baseline data and data from the new HK cohort who had experienced the reviewed induction. Data

was also analysed from the wiki, including number of times students accessed the wiki and number of contributions to the wiki.

Insert Table 1 here.

Table 1: Summary of cycles and action taken.

Findings and discussion

From analysis of initial baseline data analytics in cycle one we identified that only 26% of the HK students had accessed the university's VLE, varying from one to 17 accesses each.

Length of time spent in the VLE ranged from one minute to one hour. Compared to the UK students this was significantly lower; UK students on the same course for a comparable length of time had a minimum of 50, maximum of 150 accesses, ranging from 40 minutes to two hours.

Analysis of data collected from the baseline online survey completed by HK students indicated limited experience of technologies to support learning; six respondents had previously used a VLE; to download documents or for email. Only five respondents had been shown how to use the university VLE at the start of the course; of these four felt this had been inadequate. Fifteen students stated they were accessing the VLE weekly, however, this was not supported by the analytics which indicated much lower access. Key concerns from students impacting in a lack of engagement from the outset were identified in Table 1:

Not being able to access the VLE	8
Lack of understanding of how to use the VLE	27
Lack of understanding of the purpose of the VLE	10
Difficulties in finding information in the VLE	22
Number of clicks required to access information	24

Lack of prior experience of using a VLE	24
No planned opportunity to engage with the VLE during induction	28
Working in a second language	32
Not knowing where to go for support with technical problems	30
Slow access (poor bandwidth or wifi)	32

Table 1. Students' concerns impacting on engagement.

Compounded with these findings was the host university's requirement for students to change their password every 90 days and the time difference (eight hours) between host university and HK students; posing additional challenge to students requiring timely technical support.

Data collected from questionnaires and focus groups indicated that most students had previously been taught face to face rather than online; over half indicated visual, lectures and discussion as their prior experience of being taught. This supports findings by McConnell, Banks & Bowskill (2008) and Ishii & Shiobara (2008) that Asian students mainly experience face to face teaching. Face to face pedagogic approach to teaching was identified by 75% as their preferred method of learning. Other technologies students had prior experience of in learning were mainly limited to websites (78%); no respondents had prior experience of using a wiki or blog for learning. This was compounded by a lack of prior experience of using VLEs, together with slow wifi and reduced bandwidth. One student described the VLE as 'clunky with several clicks required before accessing information' (student B6). Resources for all modules were presented in one long list resulting in 'too much scrolling' (student B15) and difficulties 'in locating information when you have limited time to study' (student A3).

Differences between western and Asian students identified by Chen et al. (1999) were in use of images, symbols, colour and layout. This was an initial focus for the research team,

but responses to questionnaires indicated that these were not of significance to the HK students. However, four students indicated that the VLE font was small when working in a second language; in response to this a vodcast was added to VLE resources demonstrating how to make VLE font size larger, thus improving their learning experience.

To respond to the problems identified in cycle one, the learning room resources were restructured and a private space was created for HK students' resources, reflecting Wang's (2007) recognition that Chinese students prefer a private space; this was seen as a significant development in focus group interviews. A widget was created on the landing page of each learning room, which took the HK students directly to this private space; responding to the identified reduced bandwidth and need to click so many times before accessing information. The data had also identified that 74% of students had experienced technical problems with 80% of the problems related to accessing the VLE via a slow bandwidth. In response to identified technical problems a blog was created. The blog was populated with vodcasts to provide solutions to common technical difficulties, such as explaining how to access the VLE if students were locked out, and a direct link to the UK technical support team. This proved to be a helpful solution, described as a 'lifeboat' by students, impacting positively on their progression. The introduction of a timed email every 85 days to ensure students had adequate notice to change their password (university requirement every 90 days) has resulted in all students having sustained access to the VLE.

In cycle two the focus group interviews identified some reluctance of students to contribute online. This reflects Dillon, Wang & Tearle (2007) and Thompson & Ku (2005) who identified communicating online may be more difficult for students working in their second language. Salmon's (2000) 5-step model of introducing new technologies was adopted which supported students in building confidence in communicating online.

Arenas (2009) identified tutor's assumptions can impact negatively on learner

experience; there was an assumption by the course team that post-graduate students, having completed undergraduate (Level 1) and Masters (Level 2) study would have prior experience of VLEs and other technologies in learning. However, data had identified HK students had little, if any, prior experience. Significant developments to the induction were therefore made in cycle two, to provide students with opportunity to access and use the VLE in a supportive environment, again drawing on Salmon's (2000) model. Various activities delivered through the VLE, between taught weekends in HK, designed to engender collaboration and co-construction of knowledge, were adopted which resulted in increased engagement and, students reported, a deeper level of understanding. These activities involved reading specified journal articles and responding to pre-set questions, then critically discussing each other's responses via the blog and watching specified video clips relating to different research methodologies, then critically discussing these via the blog.

The focus group data also identified that students preferred to communicate using asynchronous technologies, giving them time to correct their language before making it public which raised consideration of other technologies as part of the course experience.

Additional technologies

Petre, Minocha and Barroca (2014) suggested additional technologies, such as a blog, discussion board, and wiki, may support university students, resulting in increased progression and a deeper level of learning. Data indicated HK students would value a virtual space to develop a community of practice to co-construct knowledge and share literature with peers studying on the same course across HK and the UK either asynchronously or synchronously. While this does not reflect findings of McConnell, Banks & Bowskill (2008), Wenger, White & Smith (2009) identify the importance of nurturing engagement through a community of practice which develops shared knowledge and engenders a feeling of

belonging through the use of technologies. Wenger-Trayner & Wenger-Trayner (2015)

develops this further by suggesting that boundary crossing, resulting in boundary encounters through using technologies generates new insights; in this research new knowledge emerged.

Therefore in cycle three the host university's VLE discussion board was piloted as a potentially appropriate space. However, students reported the discussion board did not engage them in sharing learning, peer support, or constructing new knowledge. This does not support findings by Rees (2010) who identified that Chinese students, working in their second language, found discussion boards convenient, although use of the discussion boards could be hampered by their lack of writing skills in English. The data further indicated this was more about the design of the discussion board within the VLE, requiring students to open each message within each discussion which, with HK student's lower bandwidth and poor wifi, made this prohibitively slow for them. It may be that as technologies develop and infrastructure improves this is an area to revisit.

A wiki was therefore introduced in cycle three providing a virtual, asynchronous, collaborative authoring space where students could co-construct new knowledge with any students from the course across time zones and platforms. Although McConnell, Banks & Bowskill (2008) identified virtual communities were rare in Asia, Petre, Minocha and Barroca (2014) found some success in developing a virtual research community for doctoral students. This research provides further evidence to support this finding.

The wiki, designed drawing on Smith et al.'s (2004) process model to support consideration of cultural use of software, provided different learning spaces hyperlinked to a main page; each was pre-populated with readings, sufficient to scaffold students in working collaboratively to co-construct new knowledge and support each other within a developing community of practice. Students were shown how to use the wiki and given opportunity to have hands on experience at a taught workshop, with a short vodcast added to the wiki to

explain how to edit pages. Students have been encouraged to request new topics for the wiki which reflects their research paradigms and their sense of ownership of this space. The wiki has grown from an initial 7 topics to 15 topics, all populated by students in each country and providing a safe space for a cross-fertilisation of perspectives across continents and ‘boundaries’ Wenger-Trayner & Wenger-Trayner (2015). Pedagogy has emerged whereby the wiki has become an integral element of taught workshops.

This inclusive approach has led to a richer learning environment. Analytics from the wiki indicate that all of the HK students access the wiki regularly. Analytics from the VLE indicate a 62% increase in use of the VLE by the HK students with 100% of students who have received the new induction engaging regularly, ie at least once a month, with the VLE; this is in line with other part-time students. Caruana & Spurling (2007) identified that online collaboration with international students can result in marginalising groups of students, however in this research students reported they feel less marginalised through the adoption of the wiki:

I was not sure of using the wiki and initially went to it for information. However, I saw what other students were writing and knew I had a contribution to make. I am proud of my contribution. (Student 6)

I feel part of a community, more of a sense of belonging to [UK university]. At first it seemed strange using the wiki, but now it is my go to space. We share our research, most loved books and writings. It's hard studying part-time so this space helps motivate me and think more deeply about my research and what I am going to write in the next document.
(Student 11)

Students have also commented on how contributing to the wiki has helped them to reflect more on their writing and develop their critical writing. For example Student 15 commented:

I have contributed to the wiki, but I lurked for a while, then wrote something down, reflected and improved my writing so that it was more critical and presented a clearer argument before I put it into the wiki. I haven't contributed online in this way before so it was a challenge, but one which I enjoyed.

Emerging pedagogy

Pedagogic practice is transforming through the use of the wiki from a traditional linear learning paradigm to a socially constructivist paradigm, identified by Leask and Younie (2001) as promoting higher cognition and deeper learning, resulting in increasingly student centred discourses and the notion of flexible pedagogies¹. While the course team has encouraged students to use the wiki both during and between taught workshops the authors are finding students increasingly taking more ownership of this space:

Although this was set up for us I feel that it is our space, owned and developed by us. I haven't contributed a lot so far, but I will do as I become more confident in my own ideas and developing knowledge. I am looking forward to doing this. (Student3).

The wiki is not aligned to assessment, rather it provides a vehicle for students to test elements of their research, which ultimately leads into assessment. Students reported this is leading to a deeper level of knowledge and understanding of concepts:

I found developing my conceptual framework so difficult. However, there are lots of examples in the wiki that students have shared so I was able to look at theirs, then create mine. Some students showed how their conceptual frameworks had developed over the course which gave me confidence in sharing my framework as it doesn't have to be a finished

¹ Defined by Ryan and Tilbury (2013) as embedding learner empowerment, future-facing education, social learning, transformative capabilities, decolonisation of education and crossing boundaries.

product. (Student 9)

When I first started to read Bourdieu's work I was excited because it aligned with my research so powerfully. However, I found it difficult to see how I could argue my findings through Bourdieu's lens. I found [...] 's work on Bourdieu which helped me clarify my own thoughts and ideas and helped me to develop my work more than I had expected. I think this is a real strength of working collaboratively in the wiki. (Student 15)

Several students also commented on how their digital literacy is developing as a result of using the different technologies. Summed up by student 18:

We have been using various technologies. I prefer the wiki and like that we can get feedback from students both here [Hong Kong] and in the UK. I was nervous of using the technologies to start with as I don't use much at work, just my mobile phone. I've found it interesting and feel much more confident in using different technologies.

The following framework is proposed drawing on key findings from this research. The framework has been shared internationally at conferences and has been well-received by academics working in similar situations, that is with groups from different cultural backgrounds:

Figure 1 here

Figure 1. Proposed framework.

Conclusion

This article contributes to understanding how to support transnational students in higher education which is an under-researched area. This research set out to identify whether changes in the use of the host university's VLE and the introduction of new technologies could improve engagement, engender a deeper level of learning and faster pace of

progression for doctoral transnational students. The research has drawn together literature relating to teaching transnational students and using technologies to provide a framework for others. This research highlights considerations when teaching transnational students with different pedagogical, cultural and technological experiences, recognising that cultural historical experience needs to inform planning. The research data indicates an emerging community of practice across continents, a deeper level of learning evidenced through development of critical thinking, collaborative learning, co-construction of new knowledge, and a cross-fertilisation of perspectives. There is an increased sense of engagement, with students reporting a reduced sense of marginalisation and increased sense of belonging and empowerment

Technology can provide rich multi-modal teaching and learning but can also be disruptive to learning. This research has provided an evidence base to support the need to understand cultural and pedagogical differences and to identify the prior experience of transnational students with technologies in learning. Further, this research evidences a richer research environment for doctoral students, created through the purposeful use of technology reflecting cross cultural and inter cultural communication.

Where co-construction of knowledge is a course expectation such as for doctoral studies, affordances of a range of technologies needs to be explored to provide the most appropriate platform for the educational context. While the importance of responding to technical challenges is recognised there is a need to ensure technologies meet or exceed the expectations of learners and an equality of experience for transnational students which enhances the digital literacy of students.

This research provides evidence that appropriate use of technologies can successfully cross cultural and continental divides although adaptations to some technologies may be necessary, such as university VLEs. As a result of this research a richer research

environment has been established through using the affordances of technologies to facilitate the sharing of research across continents. The findings resonate powerfully with the literature, presenting new findings which move existing discourses forward with a new framework for adoption by others. The limitation to this research is that it was a small scale study carried out with doctoral students at one university on the Doctorate in Education. The authors would argue that some of the learning from the research may be applicable to transnational students studying at masters and undergraduate level. Emerging pedagogy from this research also further supports the challenges academics can face in teaching students with different prior experiences of using technologies and from different cultures across all courses.

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